UroMetrics

April 25, 2000

James P. Seiler
Division of Reproductive, Abdominal, Ear, Nose
and Throat and Radiological Devices
HFZ-470
DHHS/PHS/FDA/CDRH/ODE
9200 Corporate Blvd.
Rockville, MD 20850

ATTENTION: DOCUMENT MAIL CLERK

Dear Mr. Seiler:

Enclosed is the Request for Evaluation of Automatic Class III Designation under 513(f)(2) for the UroMetrics EROS-Clitoral Therapy Device.

If you have any additional questions please feel free to call.

Philip A. Messina
President & COO
UroMetrics, Inc.
445 Etna St. Suite 56
St. Paul, MN 55106
(651) 774-1552
(651) 774-1882 fax

Sincerely,

Philip A. Messina
President & COO

enclosure

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30P-1282

CCP 1

UroMetrics

April 25, 2000

James P. Seiler
Division of Reproductive, Abdominal, Ear, Nose
and Throat and Radiological Devices
HFZ-470
DHHS/PHS/FDA/CDRH/ODE
9200 Corporate Blvd.
Rockville, MD 20850

ATTENTION: DOCUMENT MAIL CLERK

Re: 513(f)(2) request regarding 510(k) number K000280 for UroMetrics, Inc., EROS-Clitoral Therapy Device

Dear Mr. Seiler:

We allow the FDA to cross-reference this Request for Evaluation of Automatic Class III Designation under 513(f)(2) to the information contained in our 510(k) Pre-Market Notification submission 510(k) K000280 dated January 28, 2000, and all amendments, for the EROS-Clitoral Therapy Device.

We request classification of the EROS-Clitoral Therapy Device as a Class II device that is subject to general and special controls under section 513(f)(2) of the act.

The EROS-Clitoral Therapy Device is a low risk device with substantial benefits when used as intended under the care and guidance of a physician. The application of general and special controls are adequate to control the safety and effectiveness of this device.

General controls include Establishment Registration, Medical Device Listing, Manufacturing in accordance with Good Manufacturing Practices and Medical Device Reporting of Adverse Events.

Special controls include prescription and user labeling, design controls, establishment of a maximum safe vacuum level, material bio-compatibility, clinical study of the device and clearance to market by pre-market notification 510(k). Data from a clinical study based on a statistically justified number of patients has been done with this device to address the safe operating vacuum and how long that vacuum should be applied to accomplish its indicated use.

All relevant clinical data for this request has been included in the 510(k) number K000280, submitted January 28, 2000, by UroMetrics, Inc. for the EROS-Clitoral Therapy Device.

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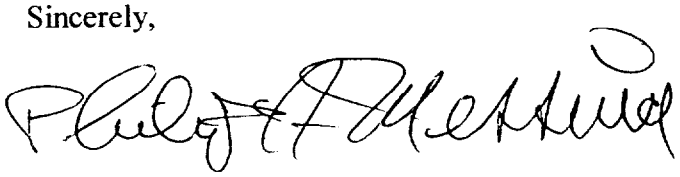

Philip A. Messina
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enclosure

Introduction

It is generally accepted that clitoral stimulation and tumescence are important aspects of female sexual arousal. Tumescence, or engorgement, occurs when the clitoris fills with blood. The female clitoris is a homologue of the male penis and the erectile process is very similar in each organ.

The clitoris consists of a cylindrical, erectile organ composed of three parts: the outermost glans or head, the middle corpus or body and the inner most crura. During sexual arousal, the smooth muscles within the clitoris relax and the arterial walls dilate. This dilation causes an increase in blood flow leading to tumescence and extension of the glans clitoris.

Certain physical conditions, which cause constriction of the vaginal and clitoral arteries, may interfere with or prevent a woman from achieving clitoral tumescence. It is believed that the difficulty or inability to achieve clitoral tumescence may be related to other symptoms of female sexual dysfunction such as: lack of desire, difficulty achieving orgasm, insufficient vaginal lubrication and painful intercourse [1].

The UroMetrics EROS-CTD™ (Clitoral Therapy Device) is designed to increase blood flow in the clitoris to assist a woman to achieve clitoral engorgement of the cavernosal tissue. This clitoral engorgement occurs in the same way as the male vacuum erection device causes penile blood flow engorgement of the cavernosal tissue. The UroMetrics EROS-CTD™ Treatment is intended for use as a therapy for women with female sexual dysfunction.

As a therapy, the EROS-CTD Treatment increases blood flow by creating a vacuum around the clitoris. The EROS-CTD device consists of a battery-operated vacuum pump and a disposable vacuum cup (CAREss™ Cup). The CAREss™ Cup is placed over the clitoris and the pump is activated to create a vacuum, which draws blood into the clitoris causing tumescence.

[1] *Goldstein, I. & Berman, J. (1998), Vasculogenic female sexual dysfunction: vaginal engorgement and clitoral erectile insufficiency syndrome.* International Journal of Impotence Research, *10 Supplement 2, S 84 – S 90* (See Appendix A)

A. Description of the Device

The EROS-CTD™ (Clitoral Therapy Device) has few components and accessories. Components are those items included with the original purchase of the EROS-CTD and accessories are additional items that may be purchased separately.

EROS-CTD™ Components

- **EROS-CTD™ Unit**
- **CAREss™ Cups (2)**
- **Satin Carrying Pouch**
- **AAA Batteries (2)**
- **Instructions for Use**
- **CAREss™ Extension Tubing (1 ft.)**
- **Accessory Reorder Form**

EROS-CTD™ Accessories

- **CAREss™ Cups**
- **Satin Carrying Pouch**
- **AAA Batteries (2)**
- **CAREss™ Extension Tubing (1 ft.)**

B. Intended Use Statement

The EROS-Clitoral Therapy Device (CTD)™ Treatment is intended as a therapy for Female Sexual Arousal Disorder (FSAD) including the following areas: diminished vaginal lubrication, diminished clitoral and genital engorgement, lowered sexual satisfaction and a reduced ability to achieve orgasm.

C. Risk to Benefit Summary

When used as intended under the care and guidance of a physician, the EROS-Clitoral Therapy Device is a low risk device with substantial benefits as explained in the discussion of Benefits (section D). The EROS-CTD device will provide significant benefits for a high percentage of women who suffer from sexual dysfunction due to difficulty or inability to achieve clitoral engorgement. The minimal risks of use of this device are explained in the discussion of Hazard and Failure Mode Effects Analysis (section E). Application of general and special controls is adequate to control the safety and effectiveness of this device.

D. Benefits of the EROS-CTD Device

When used as directed, there are many benefits of using the EROS Clitoral Therapy Device by pre-menopausal and post-menopausal females who are suffering from female sexual arousal disorder. A clinical study of females suffering from FSAD has shown the effectiveness of the EROS-CTD to provide improved sexual arousal response, including:

- **Greater clitoral and genital engorgement**
- **Increased vaginal lubrication**
- **Enhanced ability to achieve orgasm**
- **Improved overall sexual satisfaction**

Additionally, the EROS-CTD is simple to use when needed, non-invasive, non-painful, highly effective, and is associated with minimal side effects. The availability of the EROS-CTD may encourage many patients to seek treatment for their FSAD and should facilitate their successful long-term management of FSAD.

E. Hazard and Failure Mode Effect Analysis

1. **Energy** - The EROS-CTD is designed to conform to EN60601-1-2 and EN60601-1 and has been tested to meet these electrical safety standards. The device is battery powered and operates on two 1.5 Volt (AAA) batteries. Design control and adherence to these standards have minimized electrical risks of this device (e.g. leakage current and possible shock hazards).
   Special Control:
   - Design Controls are in compliance with 21 CFR 820.30 to assure that the device does not cause a risk to the user.

2. **Use Hazards** - There are minimal hazards related to use of the EROS-CTD device. Based on clinical data collected, the possible hazards of long term use of the EROS-CTD are unknown. Instructions on correct placement of the vacuum cup, including proper placement on the clitoris, are intended to reduce the possibility of misplacement on the clitoris or over a wound.
   Special Control:
   - Prescription use labeling is in compliance with 21 CFR 801.109 to minimize misuse of the device.
   - User labeling includes a reference to "Read and understand all directions before using the device" to reduce the potential for misuse of the device.

3. **Operating/Storage Environment Hazards** – There are minimal hazards related to the operating or storage environment of the device. To minimize the possible operation or storage of the device in potentially adverse conditions, the labeling states that the EROS-CTD is designed to be water resistant but it is not waterproof and should never be

submerged or operated in water. Storage labeling requires the device to be stored in the temperature range of 0° to 50° C and in the relative humidity range of 0 to 95%. This labeling is intended to minimize misuse of the device.

Special Control:

- Design Controls are in compliance with 21 CFR 820.30 to assure that the device does not cause a risk to the user.
- Prescription use labeling is in compliance with 21 CFR 801.109 to minimize misuse of the device.

4. **Vacuum Levels** - The maximum vacuum level of the EROS-CTD will not exceed 9.8 inches-Hg. Verification that 9.8 inches-Hg, applied over the surface area of the female clitoris, resulted in no adverse effects, was confirmed by using the EROS-CTD in a clinical study.

Special Control:

- Design Control in compliance with 21 CFR 820.30 to assure that safe vacuum levels are not exceeded.
- Clinical Study to verify the safety of the device in a population of normal and sexually dysfunctional subjects

5. **Failure of the Vacuum to Release** - There are 4 methods of releasing the vacuum:

1 - Turning the device off by the on/off switch.
2 - Adjusting the variable leak roller wheel to its lowest level.
3 - Uncovering the vacuum modulator port.
4 - Pulling out the vacuum cup from the EROS-CTD device.

Special Control:

- Design Control in compliance with 21 CFR 820.30 to assure that the defined methods of safely releasing the vacuum are available.

6. **Vacuum Cup-**

(a) The vacuum cup material that contacts clitoral tissue was tested for bio-compatibility per FDA Guidelines and the ISO 10993 Biological Evaluation of Medical Devices standard.

Special Control:

- Compliance with ISO 10993 and FDA bio-compatibility guidelines for skin contact materials.

7. **Risk of Infection** - There are no known risks for infection related to use of the EROS-CTD. The EROS-CTD is a prescription device intended for single patient use only. The disposable CAREss Cup is also designed for multiple use by a single patient only.

F. Summary of the Clinical Study

To demonstrate device safety and effectiveness, a clinical study was conducted. Data from normal females were analyzed for safety. Data from women with Female Sexual Dysfunction were analyzed with respect to safety and efficacy. These data were collected from two clinical research centers, Boston University and Metropolitan Urologic Specialists in St. Paul, MN.

Introduction: We tested a small, battery powered, hand held clitoral vacuum device, the EROS-CTD™ (UroMetrics, Inc.). The EROS-CTD is designed to increase blood flow to the clitoris, enhance clitoral engorgement, and ultimately improve arousal in women with Female Sexual Dysfunction (FSD). The objective of this study was to assess the safety and effectiveness of the EROS-CTD on sexual arousal (genital sensation, vaginal lubrication, ability to reach orgasm, and sexual satisfaction) in normal volunteers and women with Female Sexual Dysfunction.

Methods: A total of 25 subjects, 15 with FSD (6 pre-menopausal, 9 post-menopausal) and 10 without FSD (8 pre-menopausal, 2 post-menopausal) were studied. In-office instructions concerning device use were provided. Subjects were instructed to use the device with or without a partner. Subjects placed the device over the clitoris and adjusted the vacuum level (maximum 9.8 " Hg) for an amount of time (5-15 minutes) based on their own satisfaction and arousal. Outcome efficacy was assessed by a 4 item Female Intervention Efficacy Index (FIEI) which subjectively assessed changes in sensation, lubrication, orgasm and sexual satisfaction.

Effectiveness

Results: After using the device, FSD subjects reported: greater sensation – 100%; increased lubrication – 73%; increased ability to achieve orgasm – 47%; increased sexual satisfaction – 80%. After using the device, normal subjects reported: greater sensation – 40%; increased lubrication – 30%; increased ability to achieve orgasm – 40%; increased sexual satisfaction – 20%. No side effects were noted with use of the device.

Safety

Results: Normal females and females with Female Sexual Dysfunction used the EROS-CTD device intermittently as desired and reported continuous use for up to 4.4 minutes. The vacuum level was adjusted to a personal comfort level with a maximum vacuum level of 9.8" Hg. None of the women, with or without FSD, reported any adverse clinical effects including: skin irritation, hematoma, compromise of skin integrity, infection, or allergic response to materials used.

Conclusions: Safety and efficacy data in a statistically significant sample of subjects with and without FSD revealed improvements in sexual arousal response in FSD subjects with no adverse clinical effects. This improvement in response is perhaps directly related to an increase in clitoral blood flow and indirectly to activation of an autonomic reflex that triggers vaginal arterial vasodilatation with increases in vaginal engorgement and lubrication.

G. Proposed Classification Definition for the EROS-Clitoral Therapy Device

884.5XXX Clitoral Vacuum Device for therapeutic use.

(a) *Identification.* A battery-operated clitoral vacuum device is intended and labeled for therapeutic use in the treatment of female sexual dysfunction. The clitoral vacuum device is designed to cause clitoral and labial engorgement by creating a vacuum over the clitoris. The device includes user adjustable constant, or modulated, vacuum levels. This generic type of device may include the following accessories: battery-operated vacuum control unit, vacuum cups, and extension tubing.

(b) *Classification.* Class II (performance standards).

H. Proposed Special Controls for the EROS-Clitoral Therapy Device

a) Prescription dispensing of the device.
b) Device design to include safety mechanisms to quickly release action of the device (e.g., vacuum releasing mechanisms), patient adjustable constant and modulated vacuum levels, and maximum safe operating limits (e.g., maximum vacuum limiting mechanisms).
c) Clinical data on a statistically justified number of patients to demonstrate that the device use has no unexpected adverse effects.
d) The patient labeling conforming with 21 CFR 801.109(c) including instructions to:
   i) describe proper use of the device;
   ii) clearly identify all device safety features and limits to its use (e.g. total time of use);
   iii) describe all relevant warnings, contraindications, precautions, and risks of the device, and;
   iv) explain when the patient's physician should be consulted.
e) The physician labeling should include the same items as the patient labeling and should also include prescribing information.

Appendix A.

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Vasculogenic female sexual dysfunction: vaginal engorgement and clitoral erectile insufficiency syndromes

I Goldstein and JR Berman

Department of Urology, Boston University School of Medicine, Boston, USA

The first phase of the female sexual response, associated with neurotransmitter-mediated vascular smooth muscle relaxation, results in increased vaginal lubrication, wall engorgement and luminal diameter as well as increased clitoral length and diameter. Specific physiologic impairments of vasculogenic female sexual dysfunction include vaginal engorgement and clitoral erectile insufficiency syndromes. These syndromes exist when during sexual stimulation abnormal arterial circulation into the vagina or clitoris, usually from atherosclerotic vascular disease, interferes with normal vascular physiologic processes. Clinical symptoms may include delayed vaginal engorgement, diminished vaginal lubrication, pain or discomfort with intercourse, diminished vaginal sensation, diminished vaginal orgasm, diminished clitoral sensation or diminished clitoral orgasm. An animal model of this syndrome, with significant physiologic responses between the control and the atherosclerotic pelvic nerve stimulated hemodynamic responses, is discussed. Non-atherosclerotic, traumatic vascular disease of the ilio-hypogastric-pudendal arterial bed from pelvic fractures or blunt perineal trauma may also result in diminished vaginal/clitoral arterial blood flow following sexual stimulation. Diagnostic studies assessing the hemodynamic integrity of the ilio-hypogastric-pudendal arterial bed to the vagina and clitoris and new oral/topical pharmacologic strategies for enhancing vaginal/clitoral blood flow in patients with vasculogenic female sexual dysfunction are discussed. There is a growing body of evidence that women with sexual dysfunction will commonly have physiologic abnormalities, such as vasculogenic female sexual dysfunction, contributing to their overall sexual health problems.

Keywords: female sexual dysfunction, vasculogenic insufficiency

Introduction

Female sexuality encompasses multiple components including physiological, psychological, social and emotional factors. The first phase of the female sexual response is mediated by a combi-nation of vasocongestive and neuromuscular events which include increased clitoral length and diameter, as well as increased vaginal lubrication, wall engorgement and luminal diameter.[1–4] A physiologic disorder resulting in female sexual dysfunction can ultimately lead to or exacerbate a psychological condition, further complicating the clinical picture. As a result, it is important that female sexual complaints be addressed multi-dimensionally.

Correspondence: Dr I Goldstein.

This paper will focus on the specific physiologic impairment of vasculogenic female sexual dysfunction, described as vaginal engorgement and clitoral erectile insufficiency syndromes. The functional anatomy of the vagina and clitoris, relevant physiology of arousal, animal model studies, potential diagnosis and treatment options are reviewed.

Vaginal and clitoral anatomy

A thorough understanding of female pelvic anatomy is fundamental to the evaluation and treatment of physiologic conditions adversely affecting normal female sexual function.

Vagina

The vagina is the canal that connects the uterus with the external genital organs; its design is such that it

easily accommodates penetration of a rigid penile erection. At the posterior end the rounded neck of the uterus, the cervix, projects into the space known as the fornix or vaginal vault. Anteriorly, two pleats of sensitive tissue, the labia minora, surround the opening of the vagina and are further protected by larger folds known as the labia majora.[5-8]

The walls of the vagina consist of three layers: an inner aglandular mucous membrane epithelium, an intermediary richly supplied vascular muscularis layer, and an outer supportive fibrous mesh. The vaginal mucosa is a mucous type stratified squamous cell epithelium that undergoes hormone-related cyclical changes such as slight keratinization of the superficial cells during the menstrual cycle. The muscularis portion is known to be highly infiltrated with smooth muscle and an extensive tree of blood vessels which may swell during intercourse. The surrounding fibrous layer provides structural support to the vagina: this layer consists of elastin and collagen fibers which allow for expansion of the vaginal vault during sexual arousal or childbirth. Large blood vessels run within the mucosa, and nerve plexuses exist within muscular and adventitial layers. The vagina has many rugae or folds that are necessary for the distensibility of the organ: just how elastic it can become is exemplified during childbirth. Still smaller ridges lend to the frictional tension which exists during intercourse.[5-8]

The arterial supply to the vagina is derived from an extensive network of branching vessels, surrounding it from all sides. The anterior branch of the internal iliac artery continually bifurcates as it descends through the pelvis with a series of the newly generated vessels, each supplying the vagina to some degree. After giving off an obturator artery branch, the umbilical, and the middle rectal arteries diverge off to supply a superior and inferior vesical artery, respectively. Between the umbilical and the mid-rectal branches there is a generation of a uterine artery, which further bifurcates to give the vaginal artery. The internal pudendal and accessory pudendal artery also sends a branch. Finally, the common clitoral artery sends a branch to the vaginal muscularis.[5-8]

The neurologic innervation of the vagina originates from two separate plexuses, the superior hypogastric plexus and the sacral plexus. The hypogastric nerve plexus descends on the great vessels spreading into an inferior hypogastric plexus, which systematically branches further into a uterovaginal nerve. The somatic pudendal nerve originates off the pelvic splanchnic branches from the sacral plexus. Pudendal branching innervates the vagina towards the opening of the introitus as the perineal and posterior labial nerves.[5-8]

Immunohistochemistry studies have been utilized to better understand the innervation of the human vaginal mucosa. In a study by Hilliges *et al*[14] using protein gene product 9.5, more distal areas of the vagina had significantly more nerve fibers compared to the more proximal parts, and the anterior wall showed a denser innervation than the posterior wall. Graf *et al*[15] studied the distribution patterns and the occurrence of helospectin and pituitary adenylate cyclase activating polypeptide (PACAP) immunoreactivity. They confirmed a dense network of vasoactive intestinal peptide (VIP) immunoreactive nerve fibers showing sub-populations of helospectin and LI-type PACAP. Nerve fibers of the vagina had previously been shown to be active in association with specific peptides which include VIP, peptide histidine methionine (PHM), calcitonin gene related peptide (CGRP), and galanin. Genital vasodilation and subsequent increase in vaginal blood flow and lubrication have been observed upon exposure of vessels to VIP. VIP has been implicated as the neurotransmitter for mediating vaginal vasodilation and the formation of lubricating fluid during sexual arousal. Helospectin and PACAP, a potent vasodilator, belong to the same peptide family as VIP and PHM, and recent observations have been made to the effect that distributions and co-localizations of helospectin and VIP as well as PACAP and VIP have been reported in the mammalian gastrointestinal tract.[9-15]

The canal is lubricated primarily from a transudate originating from the subepithelial vascular bed passively transported through the interepithelial spaces, sometimes referred to as intercellular channels. Additional moistening during intercourse comes from secretion of the paired greater vestibular or Bartholin's glands, although some believe these to have a more primal function of emitting an odiferous fluid to attract the male.[5-10]

Estrogen effects on the maintenance and function of female genitalia have been well documented in studies. Estrogen receptors have been shown to exist throughout the vaginal epithelium, in stromal cells, and in the smooth muscle fibers in the muscularis. Weaker conformations of estrogen such as estriol appear more effective in stimulating the vagina as opposed to the uterus. Thickness and rugae of the vaginal wall, as well as vaginal lubrication, have been shown to be estrogen dependent. Although this fluid production has been shown to be hormone-dependent both in the resting state and during sexual excitement, quantitative changes apparently do not occur during the menstrual cycle. An insufficient amount of estrogen will result in thin vaginal walls more easily susceptible to trauma with a decreased ability to heal, as well as a drier and less acidic vaginal environment more vulnerable to infection. Vaginal dryness is associated with ovarian failure and is effectively controlled by estrogen replacement therapy. Some women who are not sexually active may not notice the extent of vaginal atrophy but when coitus does resume, pain and discomfort from intercourse can be considerable.[16-19]

Clitoris

The clitoris is the homologue of the penis arising from the embryological genital tubercle. The clitoris consists of a cylindrical, erectile organ composed of three parts: the outermost glans or head, the middle corpus or body, and the innermost crura. The glans of the clitoris is visualized as it emerges from the labia minora, which bifurcate to form the upper prepuce anteriorly and the lower frenulum posteriorly. The body of the clitoris consists of two paired corpora cavernosa of about 2.5 c in length and lacks a corpus spongiosum. The body extends under the skin at the corona to the crura. The two crura of the clitoris, formed from the separation of the most proximal portions of the corpora in the perineum, attach bilaterally to the undersurface of the symphysis pubis at the ischiopubic rami.[2–4,9–12]

A fibrous tunica albuginea ensheathes each corporal body made up of lacunar space sinusoids surrounded by trabecula of vascular smooth muscle and collagen connective tissue. No retractor clitoridis muscle exists in humans as it does in other animals such as cattle and sheep, however a supporting suspensory ligament does hold the clitoris in the introital region.[2–4,9–12]

The main arterial supply to the clitoris is from the ilio-hypogastric-pudendal arterial bed. The internal pudendal artery is the last anterior branch off the internal iliac artery. Distally, the internal pudendal artery traverses Alcock's canal, a postion of the obturator fascia and lies on the inner side in apposition to the ischio-pubic ramus. In this latter location, the artery is susceptible to blunt perineal trauma. The internal pudendal artery terminates as it supplies the inferior rectal and perineal artery, which supplies the labia. The common clitoral artery continues to the clitoris. This artery bifurcates into a dorsal clitoral artery and a cavernosal clitoral artery.[2–4,9–12]

Autonomic efferent innervation of the clitoris passes from the pelvic and hypogastric nerves to the clitoris through the urogenital diaphragm. Pelvic nerve stimulation results in clitoral smooth muscle relaxation and arterial smooth muscle dilation. There is a rise in clitoral cavernosal artery inflow, an increase in clitoral intracavernous pressure which lead to tumescence and extrusion of the glans clitoris.[2–4,9–12,20]

Using pseudorabies virus injected into the clitoris of the female rat, neurons that may be involved in regulating the autonomic and somatic reflexes seen in sexual behavior were identified by immunohistochemical assay. Major input to the clitoris was seen in spinal segments from L5-S1, and to a lesser extent in T12-L4 as well as S2-S4. Virus-labeled cells were found in the brain in multiple locations including the nucleus paragigantocellularis, raphe pallidus, raphe magnus, Barrington's nucleus, ventrolateral central gray, hypothalamus, and the medial pre-optic region. This implies a multisynaptic circuit of neurons may be involved in clitoral neurological control rather than just a simple somatic reflex connection. Morphological studies have been performed using wheat germ agglutinin conjugated with horseradish peroxidase (WGA-HRP) injected into the clitoris of the female cat to compare afferent pathways to the entire population of pudendal nerve afferents. Central projections of the clitoral afferents were identified in the L7-S3 segments with the most prominent labeling in S1-S2. In the same study, electrophysiological analysis of the clitoris performed under constant mechanical pressure stimulation indicated both phasic and tonic discharges in L7-S2, but most prominently in S1. In contrast electrical stimulation of the clitoris evoked discharges at S1 only. The neurotransmitters mediating clitoral and arterial smooth muscle dilation remain undetermined, however preliminary studies suggest that nitric oxide is involved. Histochemical studies have revealed VIP and neuropeptide Y (NPY) immunoreactive nerves in the clitoral erectile tissues.[21–23]

Somatic sensory pathways originate from the clitoral skin. There exists a dense collection of Pacinian corpuscles innervated by rapidly adapting myelinated afferents, as well as Meissner's corpuscles, Merckel tactile disks, and free nerve endings. These sensory afferents pass from the dorsal clitoral nerve to the pudendal nerve.[2–4,9–12]

Physiology of female sexual arousal

The female sexual response phase of arousal is not easily distinguished from the phase of desire until physiological changes begin to take place in the vagina and clitoris as well as other sexual organs. Sexual excitement and pleasure are accompanied by pelvic vasocongestion and swelling of the external genitalia including vaginal engorgement and clitoral erection.[3,4,8–12]

Vaginal engorgement enables a process of plasma transudation to occur, allowing a flow through the epithelium and onto the vaginal surface. Plasma transudation results from the rising pressure in the vaginal capillary bed during the arousal state. In addition there is an increase in vaginal length and luminal diameter, especially in the distal 2/3 of the vaginal canal.[3,4,8–12]

Central nervous system areas primarily implicated in sexual arousal, based on animal research, include the medial preoptic, anterior hypothalamic region and related limbic-hippocampal structures. Cognitive effects have been investigated, and although not the focus of this report at least one study is worth mentioning. Laan *et al*[24] suggests that the greatest contribution to sexual arousal in the female results from cognitive processing of stimulus content and meaning, and not from peripheral

vasocongestive feedback. There does not appear to be a relation between menstrual phases and physiologic arousability. Meuwissen and Over[28] have found that neither film-induced nor fantasy-induced levels of sexual arousal varied significantly throughout the menstrual cycle. There are conflicting reports as well as to the habituation of the female sexual response. Some claim that levels of subjective and physiologic sexual arousal decrease over repeated exposure to sexual stimuli. Others could not elucidate similar results even after 21 trials, yet both concur that the subsequent presentation of a novel stimulus will increase the female sexual response. The desire for increased sexual performance on sexual arousal in functional women have been found to facilitate genital responses, most prominently with the stimulus of erotic fantasy as opposed to erotic film. Interestingly, masturbation frequency had no effect on genital responses despite its significance on subjective reports of arousal.[24-28]

Clinicians and researchers have assumed that sexual arousal, is inhibited by the sympathetic nervous system, while facilitation and maintenance are through the parasympathetic nervous system. Meston and Gorzalka[29,30] have offered a pair of studies that investigate and challenge these notions in the woman. Firstly, they found that intense exercise, consisting of twenty-minute bike riding sessions, increased physiological sexual arousal measured by photoplethysmography. This challenged the notion that sympathetic nervous system stimulation inhibited sexual arousal in women and further provided evidence that sexual arousal was actually facilitated by the sympathetic nervous system. Another study examined the temporal effect of sympathetic activation through acute exercise on immediate, delayed, and residual sexual arousal. Sexual arousal was objectively assessed by plethysmography. A relationship between sympathetic nervous system activation and sexual arousal was found, such that sexual arousability was inhibited five minutes post-exercise, facilitated fifteen minutes post-exercise, and only marginally increased thirty minutes post-exercise. The two studies suggest that sympathetic nerve stimulation activation plays an important facilitatory role in the early stages of sexual arousal.

What is the role of the clitoris in sexual arousal? The clitoris may play a major role during sexual activity in that it is not only part of what makes the sexual act enjoyable for the woman but also enhances her response to coitus upon clitoral stimulation. Clitoral stimulation may induce local autonomic and somatic reflexes causing vaginal vasocongestion, engorgement, and subsequent transudation, lubricating the introital canal making the sexual act easier, more comfortable, and more pleasurable. The more stimulation, the higher the level of arousal and the easier it is to further increase stimulation.[31]

Vasculogenic female sexual dysfunction

Female sexual dysfunction has traditionally included disorders of desire/libido, disorders of arousal, pelvic pain disorders, and inhibited orgasm. Patient surveys estimate that 18–76% of adult women have such complaints during sexual activity.[32]

Female sexual dysfunction which may have its origin in abnormal arterial circulation into the vagina or clitoris during sexual stimulation, usually from atherosclerotic vascular disease may be considered a disorder of arousal. This vasculogenic female sexual dysfunction may include such clinical symptoms as delayed vaginal engorgement, diminished vaginal lubrication, pain or discomfort with intercourse, diminished vaginal sensation, diminished vaginal orgasm, diminished clitoral sensation or diminished clitoral orgasm. Traumatic injury to the ilio-hypogastric-pudendal arterial bed from pelvic fractures or blunt perineal trauma may also result in diminished vaginal/clitoral blood flow following sexual stimulation and fall into this vasculogenic category.

Animal model studies

A female New Zealand White rabbit model was used to directly record vaginal and clitoral hemodynamic responses following vaginal and clitoral nerve stimulation. Laser Doppler flow probes were placed within the vaginal muscularis and clitoral erectile tissues to record vaginal and clitoral blood flow, respectively. A series of animals were studied in which arteriograms were performed to confirm normal ilio-hypogastric-pudendal arterial beds. In such control animals, pelvic nerve stimulation resulted in increased vaginal and clitoral blood inflow, as well as increased vaginal wall pressure, vaginal length and clitoral intracavernosal pressure.[33]

The same animal model was used to examine the hemodynamic function in the presence of pelvic atherosclerotic vascular disease of the ilio-hypogastric-pudendal arterial bed. This was induced by repeated aorto-femoral balloon de-endothelialization followed by placing the animal on a 16 week high cholesterol diet. Arterial occlusive pathology was confirmed by arteriography and histomorphologic examination of the arterial walls of the ilio-hypogastric-pudendal arteries including the clitoral cavernosal artery. In addition, diffuse vaginal and clitoral fibrosis was observed. In those with pelvic atherosclerosis, significant diminishment of nerve-stimulated vaginal and clitoral blood flow was observed, along with reduced vaginal wall pressure and vaginal length changes. The hemodynamic alteration in vaginal and clitoral physiological

function secondary to pelvic atherosclerotic pathology in the ilio-hypogastric-pudendal arterial bed was termed vaginal engorgement and clitoral erectile insufficiency, respectively.[33]

In summary, using pelvic nerve stimulation in normal and atherosclerotic New Zealand White female rabbits, it was determined that both vaginal engorgement and clitoral erection depend on increased blood flow. Furthermore, nerve stimulated changes in blood flow were found to be significantly less in the atherosclerotic group compared to the control group. Such altered blood flow responses were also associated with other diminished physiologic changes in vaginal wall pressure, vaginal length and clitoral intracavernosal pressure.

Non-invasive diagnostic studies for vasculogenic female sexual dysfunction

Pulsed wave Doppler ultrasonography can provide a non-invasive means of detecting blood flow changes in the vaginal and clitoral arteries. Lavoisier *et al*[34] reported on the use of Doppler ultrasonography to measure blood velocity in the clitoral cavernosal artery and to record changes in flow associated with intravaginal pressure changes. They found that vaginal pressure stimulations along the lower or outer third of the vagina greatly increased blood velocity in the clitoral arteries of up to eleven times the prestimulation baseline levels. It is anticipated that duplex Doppler ultrasonography will be widely used as the diagnostic study of choice to assess clitoral cavernosal and vaginal artery integrity in women suspected of having vasculogenic female sexual dysfunction.

Vaginal photoplethysmography is another non-invasive technique which provides a quantitative record of the extent vasocongestion has occurred in vaginal capillaries. When positioned within the vagina the tampon shaped, infrared light emitting probe has a photosensitive receiving sensor which detects light reflected back from the mucosa. Less infrared light is reflected back to the photosensitive sensor with increasing vaginal mucosa engorgement. Vaginal pulse amplitudes are recorded from the AC signal and relate minute short-term changes in vaginal mucosal engorgement. Vaginal blood volumes are recorded from the DC signal and record slowly developing pooling of blood in the vaginal tissue. Both measures are good indicators of sexual function in the arousal phase of the sexual response. Until duplex Doppler studies are developed, vaginal plethysmography will be used to clinically assess vaginal engorgement capabilities.[35–39]

Vaginal thermal clearance techniques are based on the principle that vaginal blood flow changes can be recorded by measuring the heat transfer away from an intravaginal probe kept at constant temperature (usually slightly above core body temperature). As vaginal blood flow increases, more heat is transferred away from the heated device; thus more electrical power in milliwatts is needed to maintain the electrode at the fixed temperature. Higher amounts of energy indicate higher levels of blood flow. Fisher *et al* were able to use a vaginal thermistor to measure nocturnal patterns of vaginal blood flow, similar to the male.[40]

Treatment

Treatment of female sexual dysfunction is gradually evolving as more clinical and basic science studies are dedicated to the investigation of this medical problem. Female sexual complaints are not all psychologic in pathophysiology, especially for those individuals who may have a component of vasculogenic dysfunction contributing to the overall female sexual complaint. Aside from hormone replacement therapy, medical management of female sexual dysfunction remains in the early phases of development. All non-hormonal medications listed below are undergoing safety and efficacy testing for the treatment of male erectile dysfunction. Use of these agents in women with female sexual health issues should at this time be considered experimental.

Estrogen replacement therapy

This treatment is indicated in menopausal women (either spontaneous or surgical) for the treatment of hot flashes, prevention of osteoporosis, and diminishment of heart disease risk. Estrogen replacement results in improved clitoral sensitivity, increased libido and decreased pain/burning during intercourse.[41,42] Local or topical estrogen application relieves symptoms of vaginal dryness, burning, urinary frequency and urgency. No clinical evidence exists thus far that use of topical estrogen cream results in relief of sexual complaints other than local vaginal pain or vaginal dryness.[43]

Methyl testosterone

Methyl testosterone may be used in combination with estrogen in menopausal women for symptoms of inhibited desire, dyspareunia or lack of vaginal lubrication. Topical vaginal testosterone is used for treatment of vaginal lichen planus. These women, usually elderly, are noted to have clitoral enlargement, increased facial hair and increased sexual appetite. There are conflicting reports regarding the benefit of methyl testosterone for treatment of inhibited desire and/or vaginismus in pre-menopausal women.[44] In pre-menopausal women, before

prescribing methyl testosterone, it is advised to obtain a psychological and gynecologic evaluation.

Prostaglandin E1

In men, topical application of prostaglandin E1 combined with a skin enhancer such as SEPA, is presently demonstrating initial success in pilot phase II clinical trials. Clinical studies are necessary to determine the safety and efficacy of this medication used as a topical vaginally-administered vasoactive agent in the treatment of vasculogenic female sexual dysfunction. One study demonstrated increased clitoral blood flow and clitoral erection following local PGE1 injection into clitoral corporal erectile tissue.[45]

Sildenafil

Functioning as a selective type 5 (c-GMP specific) phosphodiesterase inhibitor, this medication decreases the metabolism of c-GMP, the second messenger in nitric oxide mediated male erectile response. This oral medication has proven to be safe and effective in improving erectile duration and rigidity.[46,47] In females, nitric oxide/NOS exists in human vaginal and clitoral tissue. Sildenafil may prove useful alone, or possibly in combination with other vasoactive agents for treatment of vasculogenic female sexual dysfunction. Clinical studies evaluating efficacy of this medication in women are needed.

Phentolamine

Currently available in an oral preparation with rapid absorption and metabolism, phentolamine's mechanism of action inducing vascular smooth muscle relaxation occurs via alpha-adrenergic blockade as well as by direct smooth muscle relaxation. Studies are currently in progress using this medication in women with female sexual dysfunction.

Apomorphine

This short acting dopamine agonist facilitates erectile responses via central mechanisms. A new sublingual delivery form of the medication is being tested in males with psychogenic erectile dysfunction and males with mild organic impotence. Data suggests that dopamine mediates both sexual desire and arousal. Clinical studies in females with sexual dysfunction evaluating safety and efficacy of this medication are needed.

Conclusions

Clinical research is expanding concerning the management of female sexual dysfunction. Female patients with complaints of sexual dysfunction may in selected cases undergo diagnostic studies including duplex Doppler imaging of vaginal and clitoral arteries, pudendal nerve latencies, and clitoral vibratory thresholds and sensory-pressure thresholds. Laboratory studies include blood chemistry as well as hormonal profiles. Such evaluations may result in a growing body of evidence that women with sexual dysfunction will commonly have physiologic abnormalities, such as vasculogenic female sexual dysfunction, contributing to the overall sexual health problems. Such physiologic abnormalities will likely receive benefit from medical therapies such as oral and/or topical vasodilators. The ideal approach to the management of females with sexual health problems is a collaborative effort between psychologists, therapists and physicians.

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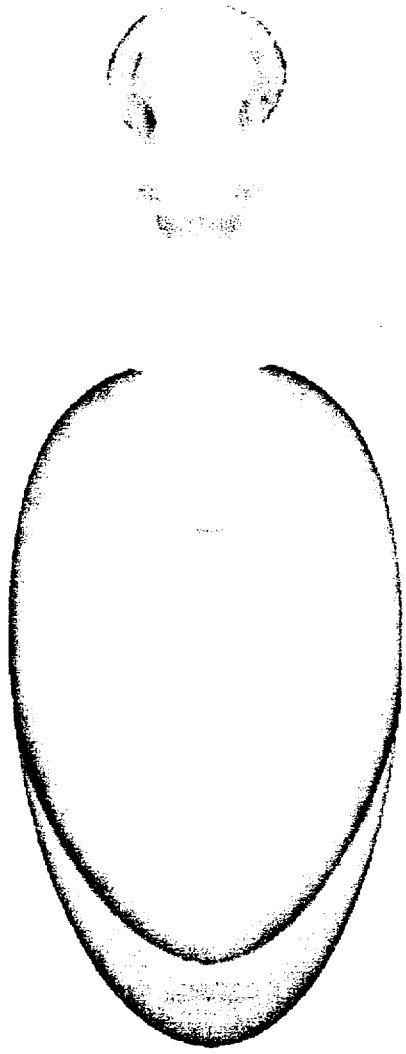
Instructions For Use

EROS-CTD™ Treatment
(Clitoral Therapy Device)



UroMetrics, Inc.

CAUTION:

Federal Law restricts this device to sale by or on the order of a physician.

Please read and understand all directions completely before using this device.

European Union (EU) Authorized Representative:

ABS Medical
BP 234
Parc d'Activite de St. Michel
88106 Saint-Die Cedex, France

Introduction

It is generally accepted that clitoral stimulation and tumescence are important aspects of female sexual arousal. Tumescence, or engorgement, occurs when the clitoris fills with blood. The female clitoris is a homologue of the male penis and the erectile process is very similar in each organ.

The clitoris consists of a cylindrical, erectile organ composed of three parts: the outermost glans or head, the middle corpus or body and the inner most crura. During sexual arousal, the smooth muscles within the clitoris relax and the arterial walls dilate. This dilation causes an increase in blood flow leading to tumescence and extension of the glans clitoris.

Certain physical conditions, which cause constriction of the vaginal and clitoral arteries, may interfere with or prevent a woman from achieving clitoral tumescence. It is believed that the difficulty or inability to achieve clitoral tumescence may be related to other symptoms of female sexual dysfunction such as: lack of desire, difficulty achieving orgasm, insufficient vaginal lubrication and painful intercourse [1].

The UroMetrics EROS-CTD™ (Clitoral Therapy Device) is designed to increase blood flow in the clitoris and assist a woman in achieving clitoral engorgement of the cavernosal tissue. This clitoral engorgement occurs in the same way as the male vacuum erection device causes penile blood flow engorgement in the cavernosal tissue. The UroMetrics EROS-CTD™ Treatment is intended for use as a therapy for women with female sexual dysfunction including; diminished vaginal lubrication, diminished clitoral sensation, lowered sexual satisfaction and a reduced ability to achieve orgasm.

As a treatment, the EROS-CTD increases blood flow by creating a vacuum around the clitoris. The EROS-CTD consists of a battery-operated vacuum device and a disposable cup (CAREss™ Cup). The CAREss Cup is placed over the clitoris and the device is activated to create a vacuum, which draws blood into the clitoris causing tumescence.

[1] Goldstein, I & Berman J. (1998), Vasculogenic female sexual dysfunction: vaginal engorgement and clitoral erectile insufficiency syndrome. International Journal of Impotence Research, 10 Supplement 2, S 84 – S 90

Precautions

Do not use the EROS-CTD™ Treatment until you have been properly evaluated by your physician and instructed in the use of the Treatment.

It is important to consult with your physician prior to using the EROS-CTD Treatment in order to avoid a delay in diagnosing any potential causes of clitoral engorgement dysfunction such as: multiple sclerosis, cirrhosis of the liver, chronic renal failure, or alcoholism.

Before you begin using your EROS-CTD Treatment, please read this "Instructions for Use" manual carefully. It provides exact instructions for its use and care.

Use of the EROS-CTD Treatment may not be advisable if you have any of the following conditions:

- Decreased pain sensation
- Manual dexterity problems
- Chronic or complicated urinary tract or vaginal infections (past year)
- Pelvic inflammatory disease (past year)
- Dyspareunia(a woman's sensation of pain or discomfort during sexual intercourse; a symptom) not attributed to vaginal dryness, (past year)
- psychological causes; history of sexual abuse, depression, etc.
- previous surgeries affecting the vault of other sexual tissues.
- medications that might interfere with sexual function
- substance abuse
- untreated atrophic vaginitis
- prolapse
- vaginismus
- vulvuvestibulitis

Discontinue use after intercourse or a 30-minute session of intermittent use, with a maximum of 4.4 minutes of continuous use. *Do not use the* EROS-CTD™ Treatment again for at least 60 minutes.

Alcohol and drugs should not be used when using the EROS-CTD Treatment.

Do not fall asleep with the vacuum of the EROS-CTD Treatment activated against your body.

Prolonged use of the device (i.e. without removal) may cause permanent injury.

The EROS-CTD Treatment is not intended for use as a contraceptive/birth control.

The user should apply the minimum amount of vacuum necessary to achieve engorgement.

The user should stop using the EROS-CTD Treatment if continued pain occurs.

Do not use the EROS-CTD device in or near water.

Do not use the EROS-CTD Treatment oil based lubricants.

Risks

A rash, rub mark or skin irritation may *occur from over use or misplacement of* the vacuum cup. Injury may occur if the vacuum cup is placed over a wound.

There is potential for risk of bruising, hematoma, pain or permanent injury when using the EROS-CTD, however none appeared in clinical studies.

Misuse of the EROS-CTD Treatment may aggravate some already existing medical conditions.

Misuse of the EROS-CTD Treatment may result in swelling of the clitoris and/or serious permanent injury to the clitoris.

If any of the above conditions develop, discontinue using the EROS-CTD Treatment and consult with your Physician.

Safety Features

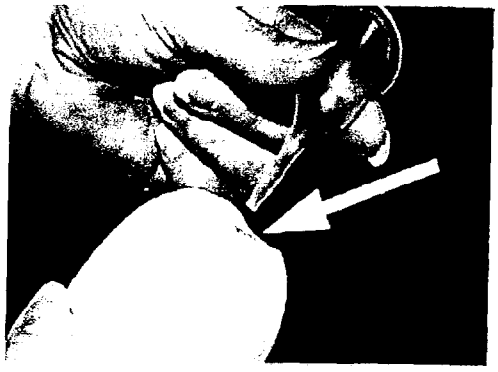
There are four methods to release or lower the vacuum level:

1. Turn the device off using on/off switch
2. Adjust variable leak roller to lowest level
3. Uncover the vacuum modulator port
4. Disconnect CAREss cup from EROS-CTD unit

Device Operation

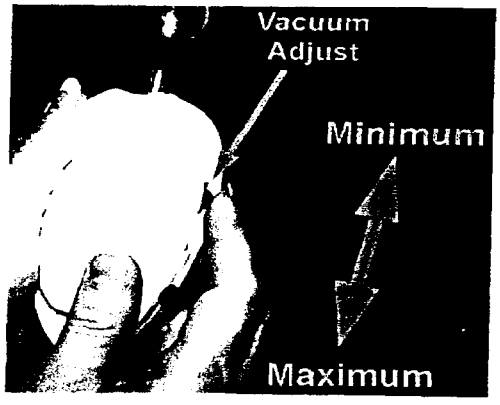
The EROS-CTD Treatment is designed for single patient use only. The EROS-CTD Treatment should not be used by multiple patients.

1. Attach the CAREss™ Cup to the hole in the indented area of the housing as shown in the photo below.

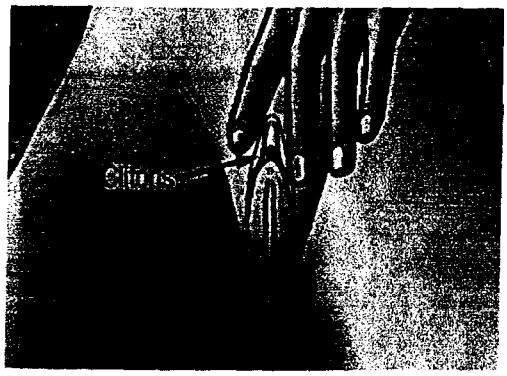


2. Turn ON (I) the EROS-CTD device.

3. Move the variable leak roller wheel so the vacuum is at its lowest setting.



4. Gently open the labia majora (outer skin) to expose the clitoris.

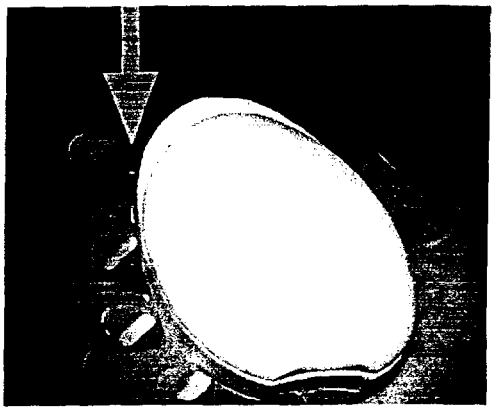


5. Place the CAREss™ Cup over the clitoris.

6. Apply a slight pressure to obtain a seal around the clitoris.

7. Adjust the variable leak roller wheel to obtain the desired level of vacuum.

8. The vacuum modulator can be used to pulsate the vacuum level. This is done by placing your finger over the vacuum modulator.



Note

The vacuum modulator only works if the variable leak roller wheel is set to less than maximum vacuum.

9. The vacuum will cause the clitoris to become engorged (filled with blood).

10. Adjust the vacuum level, as needed, to maintain engorgement.

CAREss Cup

Warning

The CAREss™ Cup is designed for a maximum of 10 uses by a single patient.

Cleaning of the CAREss™ Cup

The CAREss Cup may be cleaned with mild soap and water between sessions.

1. The cup must be removed from the EROS-CTD device before it is cleaned.

2. The CAREss Cup must be completely dry before it is reconnected to the EROS-CTD device.

Warning

The EROS-CTD device is designed to be water resistant but it is not waterproof. It should never be submerged or operated in water.

Cleaning the Housing

The device housing may be cleaned with a damp cloth.

Avoid getting water in the vacuum tube. If water enters the vacuum pump the unit may be damaged.

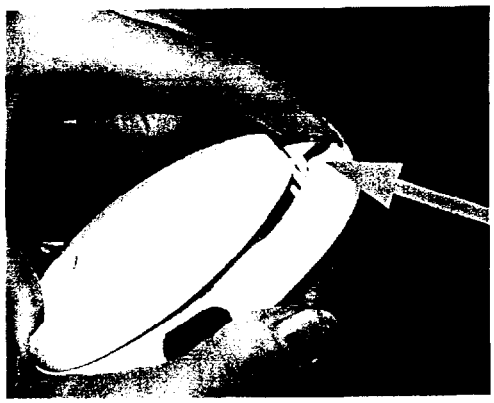
Battery Replacement

The UroMetrics EROS-CTD™ device uses 2 AAA batteries.

Warning

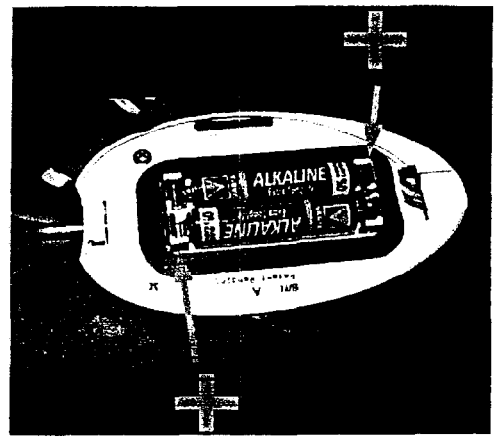
Do not recharge, put in backwards, dissemble or dispose of batteries in fire. Failure to follow this warning may cause the battery to explode, leak or cause personal injury.

1. Open the access cover to the battery compartment.



2. Remove and properly dispose of the old batteries.

3. Install the new batteries. Make sure you match the polarity (+ -) to the markings on the housing.



4. Check the cover to make sure the tab snaps closed.

Common Problems

PROBLEM	LIKELY CAUSE	REMEDY	COMMENTS
No Clitoral Engorgement	No vacuum	Apply firm pressure to the body to promote seal. Adjust variable leak roller wheel to proper level.	Problem is more often associated with inexperience; it resolves as you become more experienced.
Discomfort or Pain	Vacuum level is too high	Adjust variable leak roller wheel to proper level and/or remove finger from vacuum modulator.	You will want to experiment with the level of vacuum that is most comfortable for you.
Redness, irritation or bruising	Overuse or misplacement of vacuum cup	To ensure proper placement gently open the labia majora (outer skin) to expose the clitoris.	Consult your physician if this problem persists past the first few sessions.
Device doesn't work	No battery, dead or improperly placed battery	Replace battery ensuring proper polarity placement.	The device has an on/off switch that should be in the ON (I) position when in use.
No Vacuum	Variable leak roller wheel at lowest setting	Adjust variable leak roller wheel to proper level and/or place your finger over vacuum modulator.	For continuous vacuum, adjust variable leak roller wheel to the desired level or place your finger on the vacuum modulator to pulsate vacuum level (the roller wheel needs to be at its lowest level to fully pulsate vacuum).

Unit Specifications

Power Requirements
The UroMetrics EROS-CTD™ device operates on 2 AAA batteries.

Maximum Vacuum
9.8" Hg

Vacuum
Adjustable from 0 to 9.8" Hg

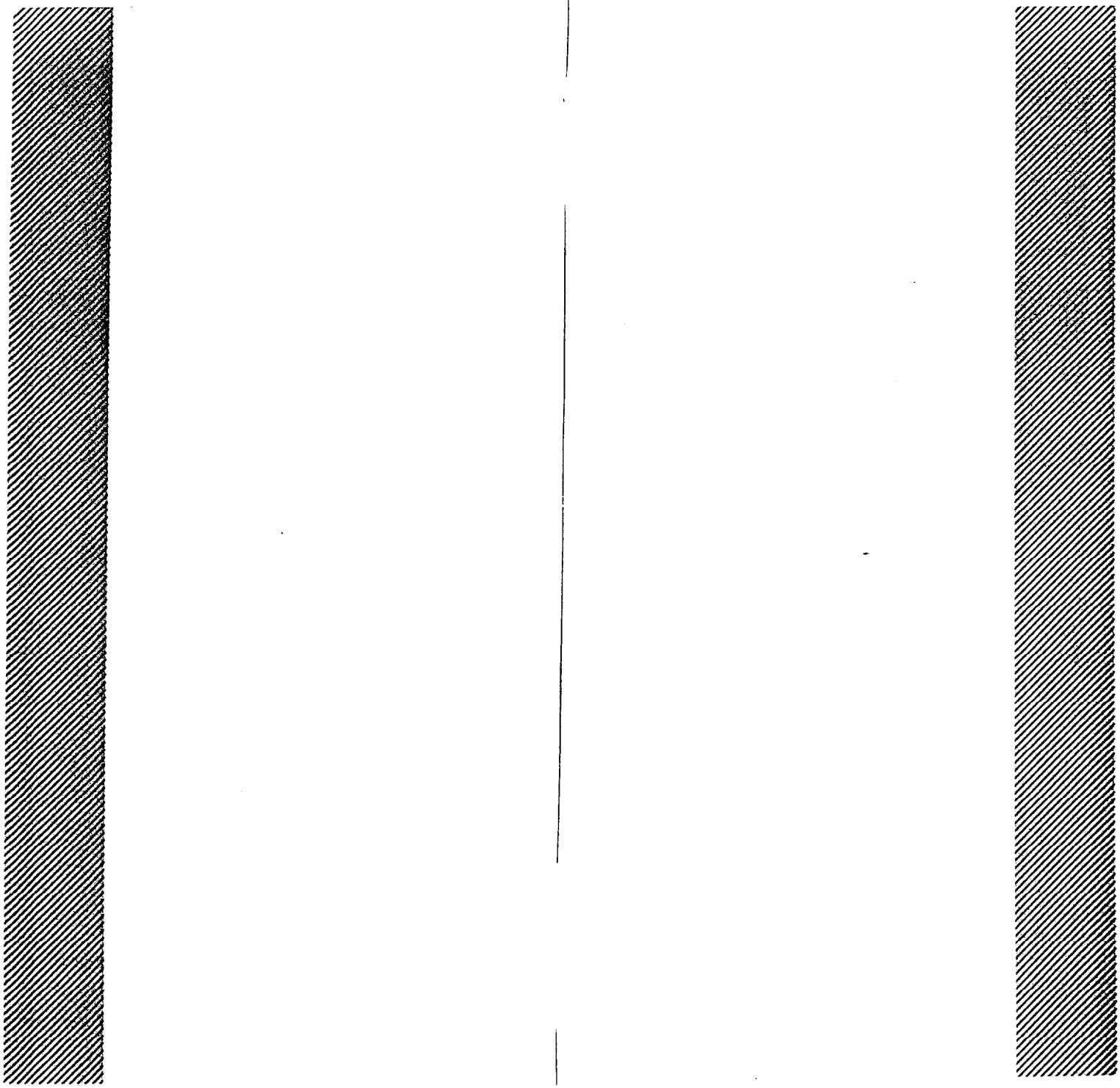
Operating Temperature: 0° to 50° C

Attention: Consult accompanying documents

BF Applied Part

EROS-CTD Components

EROS-CTD Unit
CAREss™ Cups (2)
CAREss™ Extension (1ft.)
AAA Batteries (2)
Satin Carrying Pouch
Instructions for Use
Reorder Form



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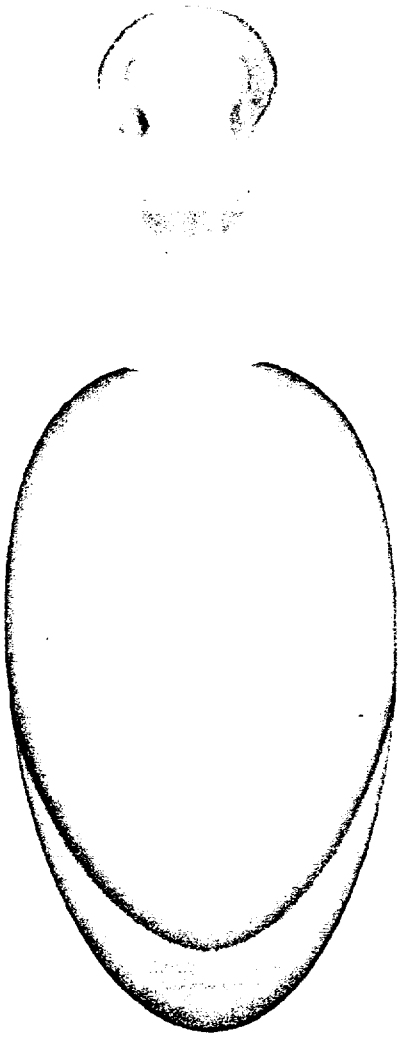
Part #: 15-40023 (Rev A)

Physician's Instruction Manual

EROS-CTD™ Treatment

(Clitoral Therapy Device)



UroMetrics, Inc.

CAUTION:

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Please read the "Physician's Instructions Manual" completely before prescribing to a patient.

Introduction

It is generally accepted that clitoral stimulation and tumescence are important aspects of female sexual arousal. Tumescence, or engorgement, occurs when the clitoris fills with blood. The female clitoris is a homologue of the male penis and the erectile process is very similar in each organ.

The clitoris consists of a cylindrical, erectile organ composed of three parts: the outermost glans or head, the middle corpus or body and the inner most crura. During sexual arousal, the smooth muscles within the clitoris relax and the arterial walls dilate. This dilation causes an increase in blood flow leading to tumescence and extension of the glans clitoris.

Certain physical conditions, which cause constriction of the vaginal and clitoral arteries, may interfere with or prevent a woman from achieving clitoral tumescence. It is believed that the difficulty or inability to achieve clitoral tumescence may be related to other symptoms of female sexual dysfunction such as: lack of desire, difficulty achieving orgasm, insufficient vaginal lubrication and painful intercourse [1].

The UroMetrics EROS-CTD™ (Clitoral Therapy Device) is designed to increase blood flow in the clitoris and assist a woman in achieving clitoral engorgement of the cavernosal tissue. The mechanism of clitoral engorgement is similar to that of the male vacuum erection device, which causes penile blood flow engorgement in the cavernosal tissue. The UroMetrics EROS-CTD™ Treatment is intended for use as a therapy for women with female sexual dysfunction including: diminished vaginal lubrication, diminished clitoral sensation, lowered sexual satisfaction, and a reduced ability to achieve orgasm.

As a treatment, the EROS-CTD increases blood flow by creating a vacuum around the clitoris. The EROS-CTD consists of a battery-operated vacuum device and a disposable cup (CAREss™ Cup). The CAREss Cup is placed over the clitoris and the device is activated to create a vacuum, which draws blood into the clitoris causing tumescence.

[1] *Goldstein, I & Berman J. (1998), Vasculogenic female sexual dysfunction: vaginal engorgement and clitoral erectile insufficiency syndrome. International Journal of Impotence Research, 10 Supplement 2, S 84 – S 90*

Precautions

The physician should properly instruct the patient in the use of the EROS-CTD™ Treatment.
The physician should diagnose any potential causes of clitoral engorgement dysfunction such as:
multiple sclerosis, cirrhosis, chronic renal failure, or alcoholism.
The physician must provide exact instructions in the use and care of the EROS-CTD.

Use of the EROS-CTD Treatment may not be advisable if the patient has any of the following conditions:
-Decreased pain sensation
-Manual dexterity problems
-Chronic or complicated urinary tract or vaginal infections (past 12 months)
-Pelvic inflammatory disease (past 12 months)
-Dyspareunia, not attributed to vaginal dryness, (past 12 months)
-psychological causes; history of sexual abuse, depression, etc.
-previous surgeries affecting the vault of other sexual tissues
-medications that might interfere with sexual function
-substance abuse
-untreated atrophic vaginitis
-prolapse
-vaginismus
-vulvuvestibulitis

The physician should advise the patient of the following:

To discontinue use after intercourse or a 30-minute session of intermittent use, with a maximum of 4.4 minutes of continuous use. Do not use the EROS-CTD™ Treatment again for at least 60 minutes.

Alcohol and drugs should not be used when using the EROS-CTD Treatment.

Do not fall asleep with the vacuum of the EROS-CTD Treatment activated against your body.

Prolonged use of the device (i.e. without removal) may cause permanent injury.

The EROS-CTD Treatment is not intended for use as a contraceptive/birth control.

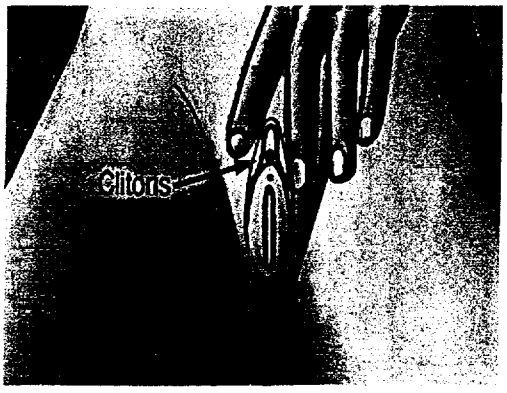
The user should apply the minimum amount of vacuum necessary to achieve engorgement.

The user should stop using the EROS-CTD Treatment if continued pain occurs.

Do not use the EROS-CTD device in or near water.

Do not use the EROS-CTD Treatment with oil based lubricants.

4. Gently open the labia majora (outer skin) to expose the clitoris.

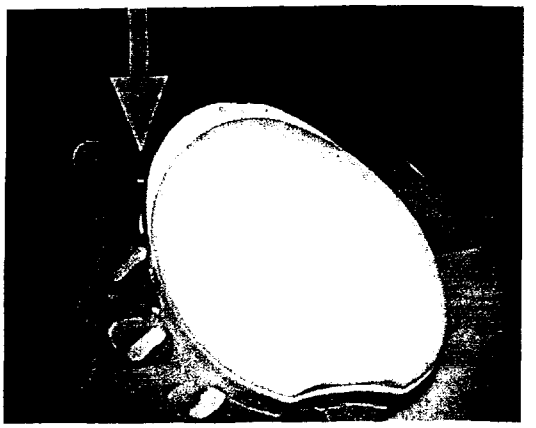


5. Place the CAREss™ Cup over the clitoris.

6. Apply a slight pressure to obtain a seal around the clitoris.

7. Adjust the variable leak roller wheel to obtain the desired level of vacuum.

8. The vacuum modulator can be used to pulsate the vacuum level by placing a finger over the vacuum modulator.



Note

The vacuum modulator only works if the variable leak roller wheel is set to less than maximum vacuum.

9. The vacuum will cause the clitoris to become engorged (filled with blood).

10. Adjust the vacuum level, as needed, to maintain engorgement.

CAREss Cup

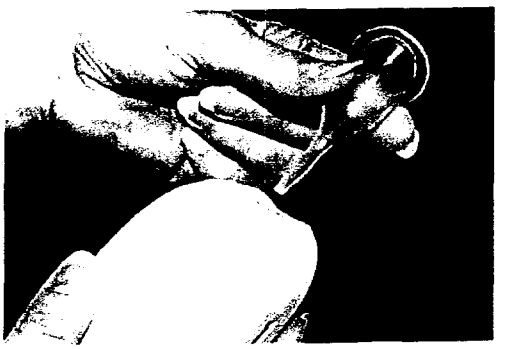
Warning

The CAREss™ Cup is designed for a maximum of 10 uses by a single patient.

Cleaning of the CAREss™ Cup

The CAREss™ Cup may be cleaned with mild soap and water between sessions.

1. The cup must be removed from the EROS-CTD device before it is cleaned.



2. The CAREss™ Cup must be completely dry before it is reconnected to the EROS-CTD device.

Warning

The EROS-CTD device is designed to be water resistant but it is not waterproof. It should never be submerged or operated in water.

Cleaning the Housing

The physician should instruct the patient in cleaning the device housing with a damp cloth.

Avoid getting water in the vacuum tube. If water enters the vacuum pump the unit may be damaged.

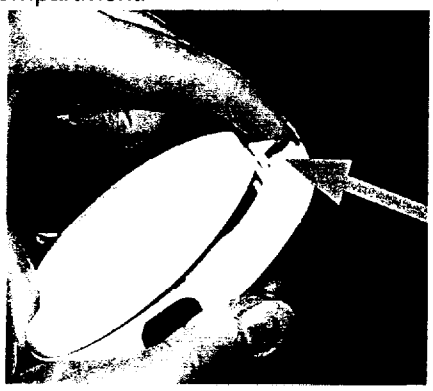
Battery Replacement

The physician should instruct the patient on replacing the 2 AAA batteries in the UroMetrics EROS-CTD™ device.

Warning

Do not recharge, put in backwards, dissemble or dispose of batteries in fire. Failure to follow this warning may cause the battery to explode, leak or cause personal injury.

1. Open the access cover to the battery compartment.



Risks

The physician should advise the patient of the following risks:

A rash, rub mark, or skin irritation may occur from over use or misplacement of the vacuum cup. Injury may occur if the vacuum cup is placed over a wound.

There is potential for risk of bruising, hematoma, pain or permanent injury when using the EROS-CTD, however none appeared in clinical studies.

Misuse of the EROS-CTD Treatment may aggravate some already existing medical conditions.

Misuse of the EROS-CTD Treatment may result in swelling of the clitoris and/or serious permanent injury to the clitoris.

If any of the above conditions develop, the patient should discontinue using the EROS-CTD Treatment and advise their physician.

Safety Features

The physician should instruct the patient there are four methods to release or lower the vacuum level:

1. Turn the device off using on/off switch
2. Adjust variable leak roller to lowest level
3. Uncover the vacuum modulator port
4. Disconnect CAREss cup from EROS-CTD unit

Protocol for Use

1. A complete medical history and physical exam, including a pelvic exam, should be performed on each patient.

2. The patient should be instructed how to operate the EROS-CTD controls.

3. The patient should be instructed how to position the device over the clitoris. The instructor should also review EROS-CTD operation at this time and demonstrate the pertinent anatomy.

4. The patient should be shown how to operate the device on LOW vacuum in the clinic with the nursing help.

5. Home instructions are as follows:

   a. The patient should start using the device during foreplay on low vacuum and engorge the clitoris for no more than 60 seconds. If discomfort occurs before 60 seconds, she should then release the vacuum and note the time interval to discomfort. After a 60 second rest, she should then repeat engorgement on LOW again for the same time interval. For the first use of the EROS-CTD the patient should not exceed 60 seconds of engorgement at LOW vacuum (or vacuum for a time interval up to any clitoral discomfort.) She may repeat this cycle 4 times with at least 60 seconds rest between cycles. Women who experience discomfort at less than 60 seconds should gradually increase the engorgement time interval at LOW vacuum until they can reach 60 seconds.

   b. Once a patient has no or little discomfort, she may increase the vacuum time interval from 1 minute to 3 minutes using LOW vacuum and intermittent pulsations (e.g. engorge and release the clitoris over the 1-3 minute time interval). Please note that the patient should be shown how to perform engorgement / release cycles as part of clinic instruction. Engorgement release cycles can be performed in sets of 3-5, either as self stimulation or prior to intercourse.

   c. Once the patient can perform the engorgement/release cycles on LOW vacuum, she may progress to moderate and then high vacuum using the same protocol. The degree of vacuum needed can be titrated according to clinical endpoints (genital sensation, lubrication, orgasm, and sexual satisfaction). The patient can also vary the time that the clitoris is kept fully engorged during the engorgement/ release cycles.

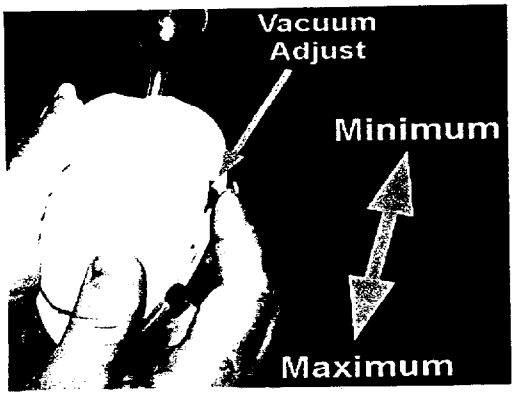
Device Operation

The EROS-CTD Treatment is designed for single patient use only. The EROS-CTD Treatment should not be used by multiple patients.

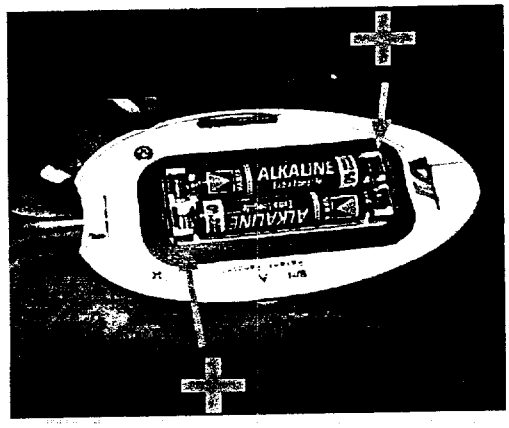
The physician or nurse should instruct the patient in operating the EROS-CTD as follows:

1. Attach the CAREss™ Cup to the hole in the indented area of the housing as shown in the photo below.

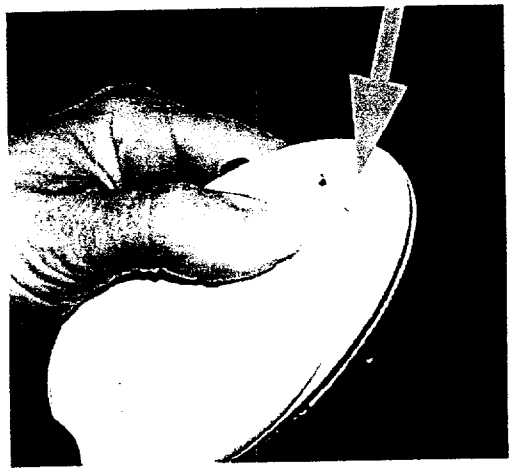
2. Turn ON (I) the EROS-CTD device.
3. Move the variable leak roller wheel so the vacuum is at its lowest setting.



2. Remove and properly dispose of the old batteries.
3. Install the new batteries. Make sure you match the polarity (+ -) to the markings on the housing.



4. Check the cover to make sure the tab is snapped closed.



Common Problems

PROBLEM	LIKELY CAUSE	REMEDY	COMMENTS
No Clitoral Engorgement	No vacuum	Apply firm pressure to the body to promote seal. Adjust variable leak roller wheel to proper level.	Problem is more often associated with inexperience; it resolves as the patient becomes more experienced.
Discomfort or Pain	Vacuum level is too high	Adjust variable leak roller wheel to proper level and/or remove finger from vacuum modulator.	The patient will want to experiment with the level of vacuum that is most comfortable for them.
Redness, irritation or bruising	Overuse or misplacement of vacuum cup	To ensure proper placement gently open the labia majora (outer skin) to expose the clitoris.	The patient should consult their physician if this problem persists past the first few sessions.
Device doesn't work	No battery, dead or improperly placed battery	Replace battery ensuring proper polarity placement.	The device has an on/off switch that should be in the ON (I) position when in use.
No Vacuum	Variable leak roller wheel at lowest setting	Adjust variable leak roller wheel to proper level and/or place your finger over vacuum modulator.	For continuous vacuum, adjust variable leak roller wheel to the desired level or place your finger on the vacuum modulator to pulsate vacuum level (the roller wheel needs to be at its lowest level to fully pulsate vacuum).

Unit Specifications

Power Requirements
The UroMetrics EROS-CTD™ device operates on 2 AAA batteries.

Maximum Vacuum
9.8" Hg

Vacuum
Adjustable from 0 to 9.8" Hg

Operating Temperature: 0° to 50° C

Attention: Consult accompanying documents

BF Applied Part

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